Abstract Submitted
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Initial condition spectral content effects on shock-driven turbulent mixing. FERNANDO GRINSTEIN, NICHOLAS NELSON, LANL — We report simulations of a shocked heavy band using the RAGE code in the implicit LES context [1]. We consider a shock-tube conguration with a band of high density SF6 gas embedded in low density air. A shock with Mach number 1.26 is transported through the band, resulting in transition to turbulence driven by the Richtmyer-Meshkov instability. The evolution of the system is followed as the primary shock traverses the SF6 band, reflects off the end-wall, propagates back and reshocks the mixing layers. We apply a variety of initial perturbations to the interfaces between the two uids in which the physical standard deviation, wave number range, and the spectral slope of the perturbations are held constant, but the number of modes initially present is varied. By decreasing the density of initial spectral modes of the interface, we nd that we can achieve as much as 25% less total mixing at late times. Analysis is based on the evolution of mixing widths, mixedness, turbulent kinetic energy, and effective Reynolds number estimates. [1] Phys. Rev. E92, 013014, 2015.

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